REMARKS

In response to the Final Office Action mailed May 22, 2008, Applicants respectfully request reconsideration. Each of the issues raised in the Office Action is addressed herein.

Claims 1-20 and 23-25 were previously pending in this application. In this paper, claims 1, 16-20, 23 and 25 have been amended. No new claims have been added or canceled. As a result, 1-20 and 23-25 are pending for examination, with claims 1, 16-20, 23, and 25 being independent claims. No new matter has been added. The application as now presented is believed to be in allowable condition.

I. Rejections Under 35 U.S.C. §103

Claims 1-2, 9, 16-20 and 23-25 (including independent claims 1, 16-20, 23 and 25) are rejected under 35 U.S.C. §103(a) as purportedly being obvious over U.S. Patent No. 6,771,966 B1 ("Chow"). Claims 3 and 10 are rejected under 35 U.S.C. §103(a) as purportedly being obvious over Chow in view of U.S. Patent No. 2004/0250128 A1 ("Bush"). Claims 4, 7-8, 11 and 14-15 are rejected under 35 U.S.C. §103(a) as purportedly being obvious over Chow in view of U.S. Patent No. 2003/0099194 A1 ("Lee"). Claims 5-6 and 12-13 are rejected under 35 U.S.C. §103(a) as purportedly being obvious over Chow in view of U.S. Patent No. 6,411,598 B1 ("McGlade"). Applicants respectfully traverse these rejections to the extent they are maintained over the claims as amended herein.

A. Discussion of Chow

Chow is related to a system and method for planning the deployment of communication links for RF networks such as an urban area radio network (Abstract). In Chow, links within effective range or within line of sight and links having an acceptable path loss in view of system gains are chosen to connect various nodes of an RF network (Col. 1, lines 25-26). A designer, based on experience, selects radio links to link radio sites (Col. 9, lines 53-55). It is noteworthy that Chow's disclosure is not related to determining the location of the nodes or radio sites themselves; rather, in Chow, nodes are previously established entities that are selected from a database that stores relative positional information on the previously determined nodes. Again, the disclosure of Chow is completely silent with respect to establishing nodes or determining node placement.

Furthermore, since Chow's disclosure is related to links that are "within effective range, within line of sight," one of skill in the art would readily appreciate that Chow does not disclose a method adapted to mesh networks, since mesh networks are typically used to connect nodes that are not within line of sight or effective range. In mesh networks, a "hopping" mechanism allows the network to continuously reconfigure and provide connections between nodes that, in contrast to infrastructure networks like RF networks, are not within effective range or line of sight. Mesh networks are dynamic networks with greater real estate coverage than infrastructure networks, which are static networks.

Additionally, nowhere in the disclosure does Chow teach or suggest the use of Media Access Control (MAC) protocols.

The method disclosed in Chow to deploy wireless communication links for RF networks comprises performing a link analysis. The link analysis relies on using link budget equations to determine the signal to interference level for a particular link. The link analysis uses several factors such as the path loss, receiver sensitivity, and transmit and receive antenna gain (Col. 15, lines 6-21). In Fig. 14, other aspects of Chow's method including Radio Link Design, Field Verification, and In-Service Analysis tools are disclosed. However, none of the tools disclosed by Chow teaches or suggests determining the placement of a network node. Furthermore, none of the tools disclosed in Chow provides information related to node capacity constraints and node demands for flow.

B. Applicants' Claims Patentably Distinguish Over Chow

The Office Action states on page 2 that MAC and meshed network are cited only in the preamble of claim 1 and are not directly related to the body of the claim. The Examiner alleges that the limitations in the body of the claim are able to stand alone without the MAC and meshed network and thus the MAC and meshed network are not accorded any patentable weight. Applicants respectfully disagree. According to MPEP §2111.02(I), any terminology that limits structure of the claimed invention must be treated as a claim limitation and be given patentable weight. The statement "the network employs a contention based media access control (MAC) protocol and the network comprises nodes and links between the nodes," as previously recited in the preamble of claim 1, limits the structure of the mesh network and thus must be given patentable weight according to MPEP §2111.02(I).

Notwithstanding the foregoing, Applicants have amended independent claims 1, 16-20, 23 and 25 without prejudice by moving some recited limitations from the preamble to the body of the claims. As these limitations were previously recited in the claims and no new matter has been added, the claims as amended do not require any additional search or substantive consideration.

1. Claim 1

Applicants' claim 1, as amended, recites "a method for determining placement of internet taps (ITAPS) in a network, the method comprising: accepting connectivity information for the network, the network being a multi-hop wireless mesh network employing a contention-based media access control (MAC) protocol and comprising nodes and links between the nodes, the connectivity information comprising link capacity constraints, node capacity constraints, node demands for flow, and a set of potential ITAPs to be opened; iterating through the set of potential ITAPs to be opened; selecting an ITAP, from the set of potential ITAPs to be opened, to be added to a set of currently open ITAPs, wherein the selected ITAP increases the node demands satisfied when opened together with ITAPs in the set of currently open ITAPs; adding the selected ITAP to the set of currently opened ITAPs; repeating the iterating, selecting, and adding until all the node demands are satisfied; and implementing the set of currently opened ITAPs in the network."

The Office Action acknowledges that Chow fails to teach or suggest all limitations of claim 1; in particular, Chow is silent on connectivity information comprising link capacity constraints, node capacity constraints, node demands for flow, and a set of potential ITAPs to be opened. The Office Action then cites U.S. Patent No. 2002/0101822 ("Ayyagari") as allegedly supporting the Official notice that wireless network connectivity information normally comprises link capacity constraints, node capacity constraints, and node demand for flows. Applicants respectfully disagree. Ayyagari merely discusses node capacity, bandwidth of nodes, and link capacity as separate entities and fails to teach or suggest how the three elements are related to provide the connectivity information recited in claim 1. Thus, the Office Action's reference to Ayyagari fails to satisfy the requirements of MPEP §2144.03.

Furthermore, there is no reason to apply or combine the teachings of Ayyagari with the teachings of Chow. Ayyagari is related to a method for performing, scheduling, routing and

accessing control in ad hoc wireless networks. Ayyagari clearly states in col. 4, lines 17-21 that prior art wireless networking schemes (such as RF networks) are unable to adapt efficiently to an ad hoc wireless network environment because of the dynamic reconfiguration of an ad hoc wireless network. One of ordinary skill in the art can thus appreciate that Chow's RF networks, which are prior art wireless networks and have static configurations, can not be adapted to Ayyagari's invention, which relates to ad hoc networks. Hence, there is no rationale for combining the teachings of Chow and Ayyagari, as Ayyagari essentially teaches away from Chow.

On page 3, the Office Action asserts that adding links is equivalent to adding nodes, and cites col. 9, lines 47-67 of Chow. However, in the cited paragraph, Chow clearly differentiates between nodes and links. For example, in col. 9, lines 53-55, Chow states "the designer, based on their experience, places the radio links, the links which join the radio sites, into the system." One of ordinary skill in the art can appreciate that Chow teaches or suggests identifying links between radio sites and therefore clearly distinguishes between nodes and links. Furthermore, in lines 47-50 of the same paragraph, Chow states "a highly skilled engineer performs a manual process to provide the best set of radio links or radio topology once the nodes and radio sites have been identified." Chow clearly distinguishes adding links from identifying nodes. If nodes and links were equivalent, Chow's highly skilled engineer would not have to conduct the manual process since the nodes have already been identified.

Applicants respectfully submit that identifying nodes and identifying links between the nodes are two distinct and separate processes and can not be considered equivalent. By definition, nodes and links are different. Nodes are points in a network where two paths intersect. A node can be realized physically in the form of a terminal, building, computer, PDA, cell phone, or router among several possible computing devices. In contrast, a link can not be a cell phone or PDA. A link is what connects two nodes of a network. In view of the foregoing, the Office Action's assertion of equivalency between adding links and adding nodes is improper.

Since adding nodes and adding links can not be considered equivalent and since Chow fails to teach or suggest a mesh network and a contention-based MAC protocol as noted above, Chow thus fails to teach multiple limitations of claim 1. In particular, Chow fails to teach or suggest a mesh network employing a contention-based MAC protocol; accepting connectivity information for the network, the network being a multi-hop wireless mesh network employing a

contention-based media access control (MAC) protocol; the connectivity information comprising link capacity constraints, node capacity constraints, node demands for flow; iterating through the set of potential ITAPs to be opened; adding the selected ITAP to the set of currently opened ITAPs; and implementing the set of currently opened ITAPs in the mesh network. Ayyagari fails to cure these deficiencies.

In view of the foregoing, claim 1, as amended, patentably distinguishes over Chow and Ayyagari, considered alone or in combination. Withdrawal of the rejection of claim 1 is respectfully requested.

Claims 2-15 depend from claim 1 and are patentable based at least upon their dependency. Withdrawal of the rejection of claims 2-15 is respectfully requested.

2. Claims 16-20

Claim 16 is a computer-readable medium claim for performing a method similar to that recited in claim 1, and therefore is believed to be in allowable condition for reasons similar to those discussed above in connection with claim 1.

Claim 17, as amended, recites, *inter alia*, the connectivity information comprising link capacity constraints, node capacity constraints, node demands for flow, a set of potential ITAPs to be opened, and a set of time intervals; iterating through the set of potential ITAPs to be opened; iterating through the set of time intervals; for each time interval, computing a total of node demands satisfied by adding an ITAP from the set of potential ITAPs to be opened, to a set of currently open ITAPs; selecting the ITAP that results in the largest increase in the sum of satisfied node demands over all time intervals; repeating the iterating, selecting, and adding until the node demands at all time intervals are satisfied.

On page 7, the Office Action alleges that claim 17 recites iterating through a set of time intervals instead of (iterating through) the set of potential ITAPS. The Office Action also acknowledges that Chow is silent on iterating through a set of time intervals and refers to the combination of Chow with Discenzo for teaching "iterating over time intervals for optimization." However, the Examiner fails to provide any information related to Discenzo in the body of the Office Action. Accordingly, the rejection of claim 17 based on the combination of Chow with Discenzo is improper. Furthermore, the Office Action alleges that the iterating process over a set

of potential ITAPs is substantially the same as the iterating process over a set of time intervals. Applicants respectfully disagree.

In contrast to the Office Action's assertion, claim 17 recites iterating through a set of time intervals **and** iterating through the set of potential ITAPS. Furthermore, the iterating process over a set of time intervals is not the same as iterating over a set of potential ITAPs. Repeating the iteration, addition, and selection of ITAPs can be performed to ensure all node demands of a network are satisfied. However, as explained in Section VI of the application beginning from ¶0062, by additionally iterating through a set of time intervals, one can take into account the variations in the work load and provision ITAPs (location and connectivity) based on the workload. As explained in Section VI, by iterating through a set of time intervals, one can optimize ITAP locations for demands over multiple time intervals, which helps improve efficiency without sacrificing user performance. One of ordinary skill in the art can thus readily appreciate that the additional limitations of iterating through a set of time intervals can not be considered substantially the same as iterating through the set of potential ITAPs. By using connectivity information comprising a set of time intervals and by iterating through all the time intervals, network configurations are configured to change and adapt over different time periods depending on the traffic over the network. Such a dynamic network configuration is possible in mesh networks, but not in Chow's network (RF networks), which are static. Hence the Examiner's assertion that iterating through a set of time intervals is substantially the same as iterating through a set of potential ITAPs has no basis in the cited references.

Claims 18-20 are computer-readable medium claims and method claims similar to claim 17 and also recite limitations related to a set of time intervals. Claims 19 and 20 additionally recite "selecting an ITAP, from the set of potential ITAPs to be opened, that satisfies the largest node demand." As noted above in connection with claim 1, Chow fails to teach the selection of ITAPs.

In view of the foregoing and for reasons similar to those disclosed above in connection with claim 1, independent claims 16-20 patentably distinguishes over Chow and are in condition for allowance. Therefore, withdrawal of the rejection of claims 16-20 is respectfully requested.

3. Independent Claims 23 and 25

Independent claims 23 and 25 relate to a method and computer-readable medium containing instructions for reducing potential placement locations of internet taps (ITAPs). The method comprises: identifying equivalence classes of nodes in a multi-hop wireless mesh network which may be serviced by an ITAP; accepting equivalence class information for the network; determining whether a first equivalence class is covered by a second equivalence class; and eliminating the first equivalence class from consideration as a potential placement location for an ITAP if the first equivalence class is covered by the second equivalence class.

As noted above, Chow is not related to adding nodes, but is related to the deployment of links for RF networks. In Chow, locations of the nodes have already been determined and the links between the nodes are selected by a designer. A link analysis is conducted to facilitate the selection of links. As noted above, Chow teaches away from mesh networks and also fails to teach or suggest the potential placements of nodes. Thus, one of ordinary skill in the art can appreciate that Chow fails to teach or suggest multiple elements of claims 23 and 25. For example, Chow fails to teach or suggest determining the location coverage of classes, identifying equivalence classes of nodes in a multi-hop wireless mesh network serviced by a particular node, and eliminating a particular class of nodes if covered by another class of nodes.

Applicants' claims 23 and 25 include a limitation on determining whether the first equivalence class and the second equivalence class are covering the same locations. The Office Action presumes that, based on general knowledge, a second equivalence class as recited in claims 23 and 25 can be interpreted as a class with a known or previously selected location. Applicants respectfully disagree and, pursuant to MPEP § 2144.03C and 37 CFR 1.104(c)(2), respectfully request the Examiner to provide some documentary evidence in support of the Examiner's assertions. The Examiner failed to provide any documentary evidence in maintaining the rejection from the previous Office Action mailed January 4, 2008. If the Examiner is relying on personal knowledge to support the finding of what is known in the art, the Examiner must provide an affidavit or declaration setting forth specific factual statements and an explanation to support the finding, pursuant to 37 CFR 1.104(d)(2).

Absent the foregoing and for the reasons discussed above, claims 23 and 25 patentably distinguish over Chow. Withdrawal of the rejections of claims 23 and 25 is respectfully requested.

Claim 24 depends from claim 23 and is patentable based at least upon its dependency. Therefore, withdrawal of rejection of claim 24 is respectfully requested.

II. Comments on Dependent Claims

Since each of the dependent claims depends from a base claim that is believed to be in condition for allowance, Applicants believe that it is unnecessary at this time to argue the allowability of each of the dependent claims individually. However, Applicants do not necessarily concur with the interpretation of the dependent claims as set forth in the Office Action, nor do the Applicants concur that the basis for the rejection of any of the dependent claims is proper. Therefore, Applicants reserves the right to specifically address the patentability of the dependent claims in the future.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, the Director is hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 23/2825, under Docket No. M1103.70167US00.

Dated: August 22, 2008

Respectfully submitted,

By: _____

Joseph Teja, Jr.
Registration No.: 45,157
WOLF, GREENFIELD & SACKS, P.C.
Federal Reserve Plaza
600 Atlantic Avenue
Boston, Massachusetts 02210-2206
617.646.8000